Corrected MDCH Mumps Testing Lab Guidance for LHDs and Providers

Providers should report suspect mumps cases to Local Health Departments (LHDs). LHDs should contact MDCH Immunization Division vaccine-preventable disease epidemiologists (517-335-9567 or 517-335-8159) to coordinate any specimens expected to go to MDCH lab, and for any testing guidance needed beyond that which is provided below.

> Follow procedures below (refer to attached CDC document **"Mumps--Laboratory Diagnosis FAQs,"** for details).

If clinically suspecting mumps (see CDC/CSTE definition, attached), obtain:

1. Serology:

- Obtain acute serum (ASAP after symptom onset) for mumps IgM.
- If patient has history of mumps immunization, also order paired acute/convalescent mumps IgG and arrange for obtaining a convalescent serum ≥14 days after acute draw.
- Note: MDCH does not offer mumps IgM. Commercial lab testing will probably yield quickest result turnaround. Alternatively, pre-approved serum can be sent to MDCH for send-out to CDC for mumps IgM.
- Send serum on cold pack via overnight courier to MDCH lab. Include a completed CDC test request form. CDC test request forms can be found at http://www.cdc.gov/ncidod/dvbid/misc/CDC50_34.pdf

2. Viral specimens: With pre-approval, these may be sent to MDCH for send-out to CDC, testing consists of PCR and/or viral culture.

- Buccal mucosa swab preferred (massage parotid area for 30 seconds prior to swabbing the buccal mucosa).
- Alternates are urine (clean catch, minimum 10 ml in sterile, empty, leak-proof container) or throat swab.
- Swabs should be placed in viral transport media tube. Leave swab in tube (cut or break off swab stem and tighten tube cap). Send specimens on cold pack via overnight courier to MDCH lab.

Adapated from **CDC - Mumps--Laboratory Diagnosis FAQs**

Specimen Collection and Management

Who should be tested for suspected mumps infection?
Mumps virus can cause illness with an acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland, lasting greater than 2 days, without other apparent cause.

Clinical diagnosis of mumps may be unreliable, suspected cases of mumps should be laboratory confirmed. As with any disease, lab work should be used in conjunction with clinical presentation (signs and symptoms). The recommendation to laboratory confirm all cases will be re-evaluated as the outbreak progresses.

Mumps should not be ruled out in someone with negative laboratory tests who is vaccinated if they have symptoms consistent with mumps.

A detailed investigation should be conducted for each case with emphasis on accurate and complete immunization history. Recent outbreaks have included many cases who had already received at least one dose of mumps-containing vaccine.

What is the clinical case definition for mumps?
An illness with acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland lasting >2 days, and without other apparent cause.

What is a confirmed case of mumps?
Confirmed mumps cases are:

1. laboratory confirmed or
2. meet the clinical case definition and are epidemiologically linked to a confirmed or probable case

What is a laboratory confirmed case of mumps?
Acute mumps infection can be confirmed by the presence of serum mumps immunoglobulin M (IgM), a four-fold rise in serum mumps immunoglobulin G (IgG) titer between acute and convalescent phase serum specimens, positive mumps virus culture, or detection of viral RNA by reverse transcription-polymerase chain reaction (RT- PCR).

Laboratory criteria for diagnosis

- positive serologic test for serum mumps IgM antibody, OR
- four-fold rise between acute- and convalescent-phase titers in serum mumps IgG antibody level by any standard serologic assay, OR
- isolation of mumps virus from clinical specimen, OR
- detection of viral RNA by reverse transcription polymerase chain reaction (RT-PCR)*

* The interpretation of a positive RT- PCR result without demonstration of mumps growth in tissue culture must be interpreted carefully, particularly among persons whose symptoms do not meet the clinical definition of mumps.

What laboratory tests are conducted for mumps and what do they mean?

Serology

- IgM: Mumps is confirmed using mumps IgM antibody testing of serum samples collected as soon as possible after symptom onset for IgM testing. A positive IgM test result indicates current/very recent infection or reinfection. As with any lab test, there can be false positive test results. If the suspected case has received one or more doses of MMR, the IgM response may be missing, delayed, or transient.
- IgG: IgG alone is not diagnostic unless you obtain both an acute (can be done as soon after onset as the patient is seen, but ideally four to five days after onset of symptoms) and convalescent (from two to four weeks after onset) blood specimen for serologic tests to determine if a four-fold rise in IgG antibody titer has occurred (e.g., from 1:40 to 1:320).

Virus detection (Direct RT-PCR or virus isolation with sequence analysis)

- Mumps viral RNA may be detected from viral samples prior at onset of parotitis until 5-9 days after parotitis (1-4 days is optimal for virus collection). Among previously immunized suspected cases, mumps virus detection is an important method of confirming the case.
- Sequence analysis of a RT-PCR product derived from a virus isolate or from clinical material confirms the presumptive positive PCR results and provides epidemiologically important information.

What specimens should be collected?
We highly recommend both the collection of serum samples and a mumps viral specimen (oral fluid or urine) on each person with suspected mumps as close to symptom onset as possible.

For the mumps viral specimen a parotid gland/buccal swab is the preferred specimen.

How should specimens be collected and managed?

1. Serologic testing: Collect 7-10 ml of blood in a red top or serum separator tube (SST). Store and ship specimens cold (using ice packs).

   Acute serum: collect within 5 days after symptom onset

   Convalescent serum: collect within 2-5 weeks after symptom onset

2. Mumps viral samples: Collect buccal swab or throat swab sample up to 9 days after symptom onset. Keep samples cold (4C) or frozen (-70C). Bulk urine should be kept cold (4C). Upon receipt at a facility equipped to centrifuge the sample, the urine is centrifuged at 4C for 10 minutes at 400 x g, recovering the sediment in 2-3 ml of sterile cell culture fluid or VTM. The urine sediment

can be frozen at -70C or held at 4C until shipment. Ship specimens using ice packs or dry ice. Avoid freeze-thaw cycles.

Parotid Gland/Buccal swab: may provide the best viral sample. Massage the parotid gland area (area forward of the ear and slightly below) for about 30 seconds prior to collection of the buccal secretions. Swab the space between the inside of cheek and the upper molar teeth. The parotid duct (Stensen's duct) drains in this space near the upper rear molars. A throat swab (oropharyngeal or nasopharyngeal swab) can also be collected and added together with the buccal swab.

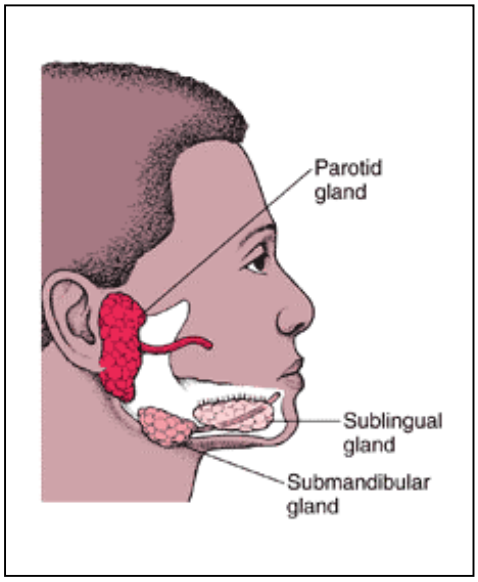
Place swab in a tube containing 2-3 mls of viral transport medium or other sterile isotonic solution (phosphate buffered saline or cell culture medium).

Urine: collect 5-10 mls from clean catch urine and store in a screw top sterile container, preferably a 15 ml centrifuge tube.

Where do I send the laboratory specimens for testing?

Contact your health department for further specimen collection and shipping instructions.

Locating the Major Salivary Glands



Mumps: an acute viral disease characterized by fever, swelling and tenderness of one or more salivary glands, usually the parotid and sometimes the sublingual or submaxillary glands (from Control of Communicable Disease Manual, 18th edition).

Public health surveillance definition (CDC/CSTE):

Mumps

1999 Case Definition

Clinical case definition

An illness with acute onset of unilateral or bilateral tender, self-limited swelling of the paraotid or other salivary gland, lasting greater than or equal to 2 days, and without other apparent cause

Laboratory criteria for diagnosis

- Isolation of mumps virus from clinical specimen, or
- Significant rise between acute- and convalescent-phase titers in serum mumps immunoglobulin G (IgG) antibody level by any standard serologic assay, or
- Positive serologic test for mumps immunoglobulin M (IgM) antibody

Case classification

Probable: a case that meets the clinical case definition, has noncontributory or no serologic or virologic testing, and is not epidemiologically linked to a confirmed or probable case.

Confirmed: a case that is laboratory confirmed or that meets the clinical case definition and is epidemiologically linked to a confirmed or probable case. A laboratory-confirmed case does not need to meet the clinical case definition